

### REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the pending application. The Examiner is also thanked for the telephone interview with Applicants' representative on December 9, 2010. The Final Office Action dated July 20, 2010 and the Advisory Action dated November 26, 2010 have been received and their contents carefully reviewed.

Claims 1-9 and 11 are currently pending. Reexamination and reconsideration of the pending claims are respectfully requested.

The Office Action rejects claims 1-2, 5-7, and 11 under 35 U.S.C. §103(a) as being obvious over "Nanofabrication of Organic/Inorganic Hybrids of TiO<sub>2</sub> with Substituted Phthalocaynine or Polythiophene" to Ding (*Ding*) in view of "Polymer brushes: surface-immobilized macromolecules" to Zhao (*Zhao*). Applicants' respectfully traverse the rejection.

In order to establish *prima facie* obviousness of the claimed invention, all the elements must be taught or suggested by the prior art. The combined teachings of *Ding* and *Zhao* fail to teach each and every element of claims 1-2, 5-7 and 11, and thus, cannot render these claims obvious.

Claim 1 recites "a step in which said substrate is functionalized by chemical grafting of one or more compounds containing at least one group that can be polymerized with one or more precursors of an electrically conducting polymer and at least one group able to be chemically grafted onto said substrate, the one or more compounds are brought into contact with the substrate, and the one or more compounds are grafted to said substrate." *Ding* fails to teach or suggest at least this element of claim 1.

The Office Action states that Ding discloses a substrate that "is functionalized by chemical grafting of one or more compounds containing at least one group (carboxylic groups, sulfonic acid groups-section I, ¶3) that can be polymerized with one of more precursors of an electrically conducting polymer (PTAA - section I, ¶3)." *Office Action*, page 3. Applicants' respectfully disagree. As explained in detail in Applicants' previous response, PTAA (poly(thiophene-3-acetic acid), as illustrated clearly in Fig. 1 of *Ding*, is already polymerized. This is not the structure that results from the above-identified method step. The result of the above-identified step is a compound (one or more) containing at least one group *that can be*

***polymerized*** with one or more precursors of an electrically conducting polymer and at least one group ***that can be chemically grafted*** onto said substrate.

Claim 1 further recites “a step in which said substrate thus functionalized is impregnated with a solution containing said precursor(s); and a step in which said precursor or precursors are polymerized to obtain polymers grafted to said substrate through the one or more compounds grafted to said substrate.” *Ding* fails to teach or suggest any method step involving the impregnation of the substrate with precursors. In fact, the Office admits this deficiency.

The Office Action then alleges that *Zhao* cures the deficiency of *Ding*. Applicants’ respectfully disagree. Also as discussed in the Applicants’ previous response, *Zhao* does not describe a process for preparing a pn-semiconductor material and, therefore, *Zhao* does not describe interpenetration (impregnation) of the n-semiconductor or p-semiconductor regions. In view of at least these short-comings of *Ding* and *Zhao*, the combined teaching fails to disclose each and every step recited in method claim 1, even if one of ordinary skill in the art would have been motivated to combine *Ding* and *Zhao*.

Accordingly, claim 1 is allowable over the combined teachings of *Ding* and *Zhao*. Claims 2, 5-7, and 11 variously depend from claim 1, and are also allowable for at least the same reasons as claim 1. Applicants’, therefore, respectfully request withdrawal of the rejection of claims 1-2, 5-7, and 11.

The Office Action rejects claims 3-4 and 11 under 35 U.S.C. §103(a) as being obvious over *Ding* and *Zhao* and further in view of “A low cost, high efficiency solar cell based on dye sensitized colloidal TiO<sub>2</sub> films” to O’regan (*O’regan*). Applicants’ respectfully traverse the rejection.

Claims 3, 4, and 11 variously depend from claim 1 and incorporate all the elements of claim 1. As discussed, the combined teaching of *Ding* and *Zhao* fails to teach or suggest at least the above-recited elements of claim 1. *O’regan* does not cure the deficiencies of *Ding* and *Zhao*. In fact, the Office Action only cites *O’regan* for disclosing that the nanoparticles are mesoporous. *Office Action*, page 5. Whether or not this is true, the combined teaching of *Ding*, *Zhao*, and *O’regan* fails to teach each and every step in method claim 1. Accordingly, claims 3, 4, and 11 are allowable over the combined teaching of *Ding*, *Zhao*, and *O’regan*. Applicants’, therefore, respectfully request withdrawal of the rejection of claims 3, 4, and 11.

The application is in condition for allowance and early, favorable action is respectfully solicited. If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (202) 496-7500 to discuss the steps necessary for placing the application in condition for allowance. All correspondence should continue to be sent to the below-listed address.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. §1.136, and any additional fees required under 37 C.F.R. §1.136 for any necessary extension of time, or any other fees required to complete the filing of this response, may be charged to Deposit Account No. 50-0911. Please credit any overpayment to deposit Account No. 50-0911. A duplicate copy of this sheet is enclosed.

Dated: January 20, 2011

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